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IS 10380 (1982): Methods of test for printing ink permeation of paper (castor oil test) [CHD 15: Paper and its products]



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Indian Standard

METHODS OF TEST FOR
PRINTING INK PERMEATION OF
PAPER (CASTOR OIL TEST)

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NEW DELHI 110002

Indian Standard

METHODS OF TEST FOR PRINTING INK PERMEATION OF PAPER (CASTOR OIL TEST)

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Indian Standard
**METHODS OF TEST FOR
PRINTING INK PERMEATION OF
PAPER (CASTOR OIL TEST)**

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 31 December 1982, after the draft finalized by the Paper and Its Products (Excluding Packaging Materials) Sectional Committee had been approved by the Chemical Division Council.

0.2 The method prescribed in this standard consists of measuring the time in which a drop of castor oil produces a uniform translucent spot in paper. It is a measure of the receptivity of paper to printing inks having an oil vehicle, but is suitable only for easily permeable papers, such as news, book and mimeograph.

0.3 In reporting of the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

1. SCOPE

1.1 This standard prescribes the method of test for printing ink permeation of paper (castor oil test), for inks having an oil vehicle.

2. TERMINOLOGY

2.1 For the purpose of this standard the definitions given in IS : 4661-1968† shall apply.

*Rules for rounding off numerical values (revised).

†Glossary of terms used in paper trade and industry.

3. APPARATUS

3.1 The apparatus (Fig. 1) consists of a box having an open front; a smooth sheets material top having a 20 mm diameter hole for observation of the specimen; a groundglass partition parallel with the front side to prevent excess heat from affecting the test results; a 25-watt electric bulb placed at the back of the partition for illumination of the samples; and an adjustable mirror near the bottom of the box and centred on the hole in the top of the box for observation of the specimen.

3.2 A separatory funnel, with a tip approximately 20 mm in length and of such diameter that 25 drops of distilled water delivered at 27°C will have a volume of 1 ml is suspended with the end of the tip approximately 45 mm above the test specimen and contains castor oil, the temperature of which is maintained during the test at $27 \pm 2^\circ\text{C}$.

4. REAGENT

4.1 Castor Oil — Castor oil conforming to medicinal grade of IS : 435-1973*.

5. TEST SPECIMENS

5.1 From each test unit of the sample cut square specimens each of side 5 cm.

6. PROCEDURE

6.1 Condition of the test specimens as prescribed in 5 of IS : 1060 (Part I)-1966†.

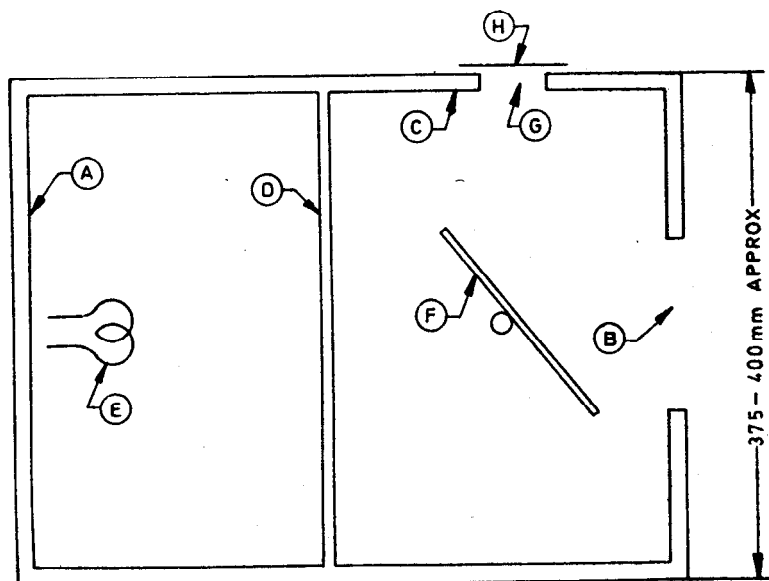
6.2 Place the specimen over the hole in the top of the box. Let a drop of the castor oil fall from the funnel upon the specimen and start a stop watch the instant the drop strikes the specimen. Observe the underside of the specimen and measure the time intervals from the instant of contact of the oil with the paper until the spot of oil reaches a uniform and maximum translucency (sheen or mirror — like surface). Covering the spot of oil with a small bottle cap having a black interior aids in the determination of the end point.

7. REPORT

7.1 Report the maximum, minimum and average time of penetration, to the nearest 5 seconds, for not less than five tests on each side of the paper.

*Specification for castor oil (*second revision*).

†Method of sampling and test for paper and allied products : Part I (*revised*).



- A = Box;
 B = Open front in box;
 C = Smooth sheet material top;
 D = Partition, ground glass;
 E = Electric bulb, 25 W;
 F = Adjustable mirror;
 G = Hole, 20 mm diameter hole; and
 H = Test specimen.

FIG. 1 APPARATUS FOR TESTING PRINTING INK PERMEABILITY OF PAPER

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²